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PATENT SPECIFICATION

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(COMPLETE SPECIFICATION

Process for the Production of Hollow Valves and Valves  
Obtained by this Process

I, GABRIEL JEUDI also known as JEUDY, a citizen of the French Republic, of 74, Avenue Kléber, Paris, France, do hereby declare the invention for which I pray  
5 that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

It is known to employ, for the purpose  
10 of reducing the temperature of valve heads in internal combustion engines, hollow valves containing sodium, the very good conductivity of which causes the heat accumulating in the head to be trans-  
15 mitted to the stem, so that this heat can be dissipated through the valve guide.

Various methods have already been proposed for constructing such hollow valves, but these methods are not entirely satisfactory and considerable rejects are  
20 produced thereby.

In the process according to this invention, the head of the valve is closed by a cap provided with a circular machined  
25 flange which fits into a centering groove which is also machined in the head.

The machining of the flange and of the groove is such that the two parts of the valve must be assembled by means of a  
30 press. The strength of the assembly is supplemented by a welding bead formed externally along the junction line between these two parts. Thus, in the welding, the cap is maintained perfectly  
35 on the body and during operating the tight fit of the cap on the body, together with the said bead, adds to the rigidity of the unit.

In order to prevent the force applied  
40 by the press from causing deformation of the cap or of the valve head, the groove necessary for positioning the bead of welding material along the junction line is preferably machined after the assembly  
45 in the press.

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The description which follows with reference to the accompanying drawings, which are given by way of example, will enable the manner in which the invention  
50 can be carried into effect to be readily understood.

In these drawings, Figure 1 shows in longitudinal section a valve and the cap thereof before assembly in the press.

Figure 2 shows, under the same conditions, these two parts after the operation  
55 of the press.

Figure 3 shows under the same conditions the same valve after machining of the groove for the formation of the welding  
60 bead.

Finally, Figure 4 shows the finished valve, the welding having been completed and the assembly having been machined  
65 to the final dimensions.

The valve body 1 shown in these figures is preferably formed from a cylindrical rod by a first swaging operation which expands the head 1a. The axial bore 2 is  
70 then drilled in the solid valve body thus obtained, and the recess 3 is machined.

It will be noted that the latter machining operation is facilitated by the wide  
75 flare of this recess, which enables the formation of valve walls of very accurately predetermined thickness.

In addition, a cap 4 having a flange 4a is formed by pressing. A central circular  
80 groove 5 is machined in the valve body to receive the flange 4a.

The external diameter D to which the cap is machined is made slightly greater than the maximum diameter d of the  
85 groove 5. Similarly, the thickness E of the flange 4a is made slightly greater than the width e of the groove. In order to facilitate assembly the edges of the flange 4a are slightly chamfered.

Thus, in order to position the cap on the valve body, it is necessary to employ  
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a press, the form of the valve thus obtained being shown in Figure 2.

A welding groove 6 (see Figure 3) is then turned on a lathe on the upper face 5 of the head of the valve, the said welding groove overlapping the junction line 7 between the cap and the body of the valve. This groove could equally well be formed before the assembly, while, for example, 10 a bevel previously machine on the edge of the cap would reduce the resistance of the flange 4a during assembly in the press.

Since the cap is maintained perfectly in position, a welding bead can be effectively 15 provided in the groove 6. When this bead has been applied, the valve may be brought to its final external dimensions, and the longitudinal section thereof is then as shown in Figure 4.

20 In order that this valve may be filled with sodium, the bore 2 may be extended by a narrow bore 8 leading to the end of the valve stem. Alternatively, this bore 8 may be omitted and the sodium may be 25 introduced into the valve before the cap 4 is positioned.

What I claim is:—

1. A process for the production of a hollow valve in which the valve head is 30 closed by a cap, characterised in that a

circular flange is machined in said cap and a centring groove of corresponding form is machined in the face of said valve head, the assembling of said cap into said head being effected by fitting said flange 35 into said groove by means of a press and thereafter welding along the junction line between the cap and the head.

2. A process as claimed in Claim 1 characterised in that the maximum 40 diameter of the flange of the cap is slightly greater than the maximum diameter of the groove.

3. A process according to Claims 1 or 2, characterised in that the thickness of 45 the flange is slightly greater than the width of the groove.

4. A process as claimed in Claim 1, characterised in that the junction line is machined to provide a groove between the 50 cap and the head before or after the assembly of the cap with the head.

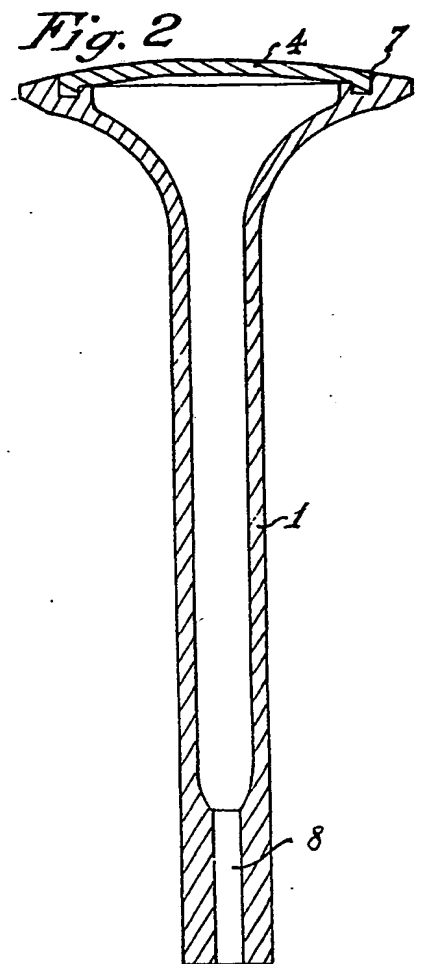
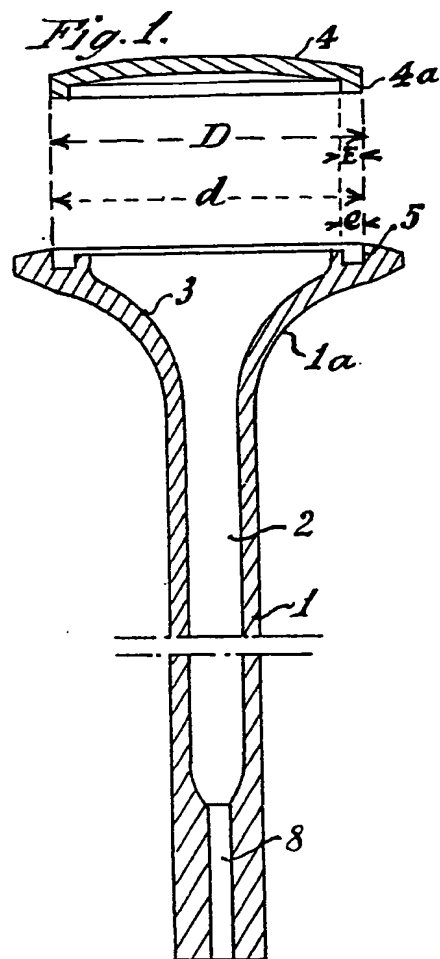
5. A hollow valve produced by the process claimed in any one of the preceding Claims. 55

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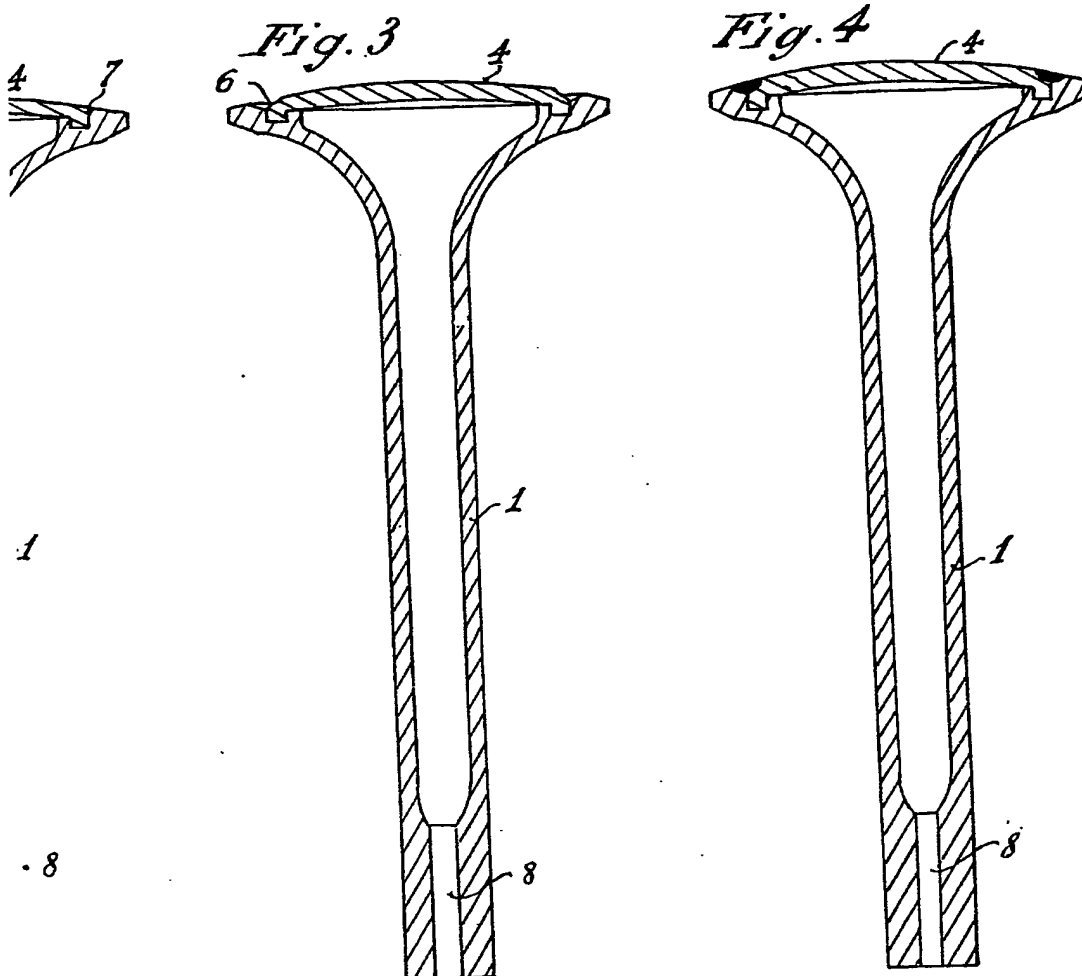
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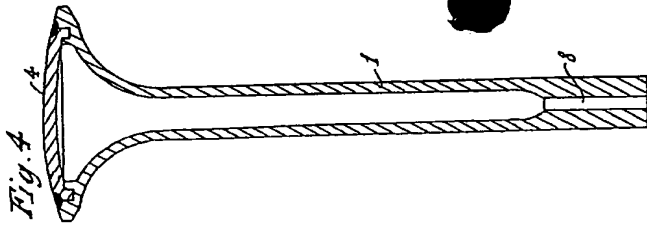
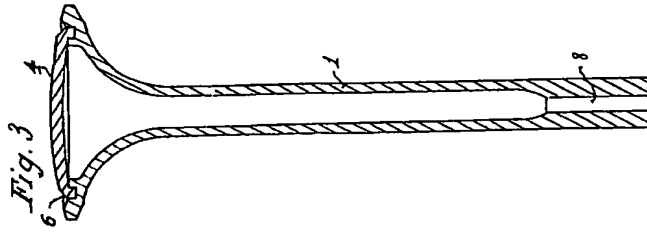
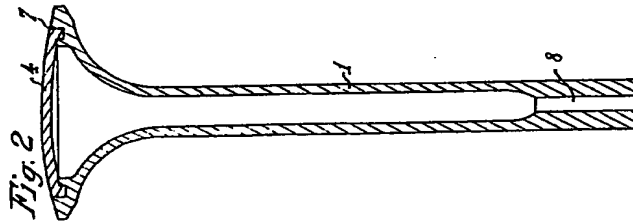
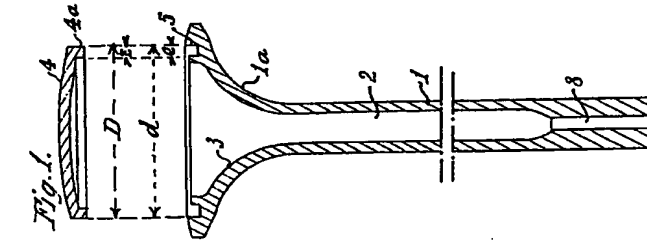
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